

Remarks

Favorable review is requested in view of the above amendments and following remarks. Editorial amendments have been made to claim 31. No new matter has been added. Claims 1 - 29, 31, 50 - 64, and 74 - 75 remain pending in the application.

Claims 1 - 29, 31 50 - 64, and 74 - 75 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshioka et al. (U.S. Patent No. 5,194,363) in view of Yoshioka et al. (JP 04 - 052188) and either of Yoshitomi et al. (JP 63 - 171453), Kinou et al. (JP 03 - 248338 or JP 01 - 276453), or Shino et al. (JP 05 - 274726). Applicants respectfully traverse this rejection, and respectfully request reconsideration in view of the following comments.

Claims 1 and 50 are directed to optical recording media having a reversible phase change recording layer. Claim 31 is directed to the use of an optical phase change recording medium for recording/reproducing/erasing information.

The rejection relies on Yoshitomi et al. (JP 63 - 171453), Kinou et al. (JP 03 - 248338 or JP 01 - 276453), or Shino et al. (JP 05 - 274726) as suggesting the use of certain additional materials in a GeN or GeNO layer for the recording layer as required by the present independent claims. The rejection acknowledges that these references are directed to magneto-optical recording media, but contends that the use of the additional materials in the magneto-optical field would suggest their application to protective layers for phase change recording media. Applicants respectfully disagree and submit that those skilled in the art would not have expected that materials useful in protective layers for magneto-optical recording media could be used successfully for phase change recording media.

Applicants provide herewith the Declaration of Rie Kojima to support their position. Ms. Kojima is an active researcher and author in the field of optical recording media. See page 1 of the Declaration. Page 2 of the Declaration discusses the differences in mechanism between magneto-optical and phase change recording media, and explains the impact that such differences have on layers that protect the recording layers of such media. In particular, Ms. Kojima explains at pages 2-3 how the phase change mechanism creates problems of maintaining adhesion between a protecting barrier layer and recording layer, while magneto-optical recording media generally are free from such issues. Because of these basic differences, Ms. Kojima concludes that "persons skilled in this field would have no reasonable basis to expect that

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materials used in a magneto-optical system could be used successfully in a phase change system."

Ms. Kojima's Declaration establishes, contrary to the assumption in the rejection, that materials for barrier layers in phase change and magneto-optical recoding media are not considered interchangeable. Therefore, there would have been no reasonable expectation from the prior art that the present invention successfully could be obtained upon making the combination of the reference teachings. See In re Dow Chemical, 5 U.S.P.Q.2d (Fed. Cir. 1988). At most, the references establish that it might be "obvious to try" the invention of the present claims, but "obvious to try" is not the standard of 35 USC 103. In re Goodwin, 198 USPQ 1, 3 (C.C.P.A. 1978).

Moreover, the rejection relies on the layer 20 in Yoshioka et al. '363 and the layer 4 of Yoshioka et al. '188 for the teaching of GeN or GeNO barrier layers for phase change recording layers as required by claims 1 and 31. Applicants respectfully submit that this is not a reasonable interpretation of the references.

Neither reference ascribes a protective function to the layer in question. Yoshioka et al. '363 describe a recording layer that is formed from a ternary alloy of Te, Ge and Sb and at least one nitride of Te, Ge or Sb. Yoshioka et al. '363 suggest that a recording layer include nitrogen to achieve the object of the invention. See column 3, lines 5 - 46 of Yoshioka et al. '363. In order to further this goal, the reference provides nitrogen-containing surface layer 20. This is further evidenced in Figure 3 of Yoshioka et al. '363, where the adsorption surface layer 20 provides nitrogen to the active layer 18 of Te-Ge-Sb ternary alloy. However, Yoshioka '363 is silent as to forming a barrier layer from a Ge or GeO nitride, much less such a barrier layer that further contains an additional element. Likewise, Yoshioka et al. '188 describes an optical recording medium in which a nitride layer, such as GeN, is positioned between a recording layer and a dielectric (protective) layer. The nitride layer is melted with a laser beam, so that the nitrogen may be incorporated into the recording layer. See the abstract of Yoshioka et al. '188, enclosed. However, like Yoshioka et al. '363, Yoshioka et al. '188 is silent as to forming a barrier layer from a Ge or GeO nitride and an additional element.

As the Yoshioka et al. references are silent as to a protective function for the GeN or GeNO layer, there is no motivation from within the references themselves to make the combination of Yoshioka et al. '363 or '188 with the remaining references as required by the

rejection. In the absence of such motivation, the rejection is improper. In re Dow Chemical, supra. Even if the GeN or GeNO layers as actually disclosed in the Yoshioka et al. references in fact would act as protective layers, a point which is not being conceded here, this would be relevant to an issue of anticipation, not the obviousness rejection at issue here.

Moreover, as the Yoshioka et al. references provide dielectric layers for a protective function, the combined teachings of the references would result in the additional materials from Yoshitomi et al., Kinou et al., or Shino et al. being included in the dielectric protective layer of the Yoshioka et al. references, not in the nitrogen supplying layers 20 and 4.

Conclusion

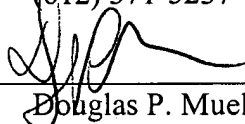
In view of the comments presented herein, favorable reconsideration in the form of a Notice of Allowance is respectfully requested. If any further question should arise, the Examiner is invited to contact Applicants' representative at the number listed below.

Respectfully Submitted,

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By



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Version with Markings to Show Changes Made

Please amend claim 31 as indicated herein.

31. (Twice amended) A method of recording/erasing/reproducing [am] optical information, comprising the steps of:

providing an optical information recording medium comprising a substrate and a multilayer film, the multilayer film comprising a recording layer generating a reversible phase-change which can be optically detected according to an irradiation of an energy beam, a barrier layer, and a protective layer;

recording a signal to said recording layer by irradiating said recording layer with a modulated laser beam erasing a signal recorded on said recording layer by irradiating said recording layer with a laser beam having a predetermined power level;

reproducing a signal recorded on said recording layer by irradiating a laser beam to said recording layer and detecting a light strength of a reflection light or a transmitted light from said recording layer;

wherein said barrier layer is formed between said protective layer and said recording layer and in contact with said protective layer and said recording layer [in contact with said protective layer and said recording layer], and includes one of GeN and GeNO and at least one element selected from the group consisting of Al, B, Ba, Bi, C, Ca, Ce, Cr, Dy, Eu, Ga, Hf, In, K, La, Mn Nb, Ni, Pb, Pd, Si, Sn, Ta, Ti V, W, Yb, Zn, and Zr.

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